

SAWFLIES OF THE TRIBE PSEUDODINEURINI IN NORTH  
AMERICA (HYMENOPTERA: TENTHREDINIDAE)

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ABSTRACT—Keys are given for the three world genera of Pseudodineurini, *Pseudodineura*, *Kerita*, and *Endophytus* and for the species of the two North American genera, *Pseudodineura* and *Kerita*. Species treated are *Kerita fidala* Ross from eastern North America, *K. atira*, n. sp. and *K. difala*, n. sp. both from western North American, *Pseudodineura parvula* (Klug), *P. parva* (Norton), and *P. releda*, n. sp. from eastern North America, and *P. lehosa*, n. sp. from western North America. Larvae of members of this tribe are leaf miners. The known North American hosts are *Mertensia* (Boraginaceae), *Hepatica* and *Ranunculus* (*Ranunculaceae*).

The Pseudodineurini, a tribe of the Nematinae, are a small group of leaf mining sawflies consisting of three world genera. Adults are small and not commonly collected; consequently, this tribe has received scant attention in North America where only two genera, *Pseudodineura* and *Kerita*, with one species in each, have been recorded. The two North American species were known from only several localities in the eastern United States west to Illinois. In this study, three species of *Pseudodineura* and two species of *Kerita* are added to the North American fauna, and both genera are shown to be transcontinental in distribution. Four of the species are new, and one species, *P. fuscula* (Klug), is possibly an adventive from Europe.

In contrast to the little amount of work in North America, several articles have been published on the European species, mostly by Hering (1929, 1935), Buhr (1941), Wahlgren (1944), Enslin (1914, 1921), Hellén (1960), and Vikberg (1967). Nine species of *Pseudodineura* and one species of *Endophytus* are known from Europe, and biological notes have been published on nearly all of them. All are leaf miners in the larval stage in herbaceous plants of the Ranunculaceae such as species of *Ranunculus*, *Clematus*, *Trollius*, and *Anemone*.

Benson (1938) first established the tribe Pseudodineurini and separated it from other members of the Nematinae by the absence of the anal cell of the hindwing and tridentate mandibles, characters which still distinguish the tribe. Members of the Pristolini also lack an anal cell in the hindwing but have only one minute tooth on the mandibles, and the postnotum is flat and exposed, separating the posttergite and metascutellum.

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## KEY TO WORLD GENERA OF PSEUDODINEURINI

1. Forewing with vein 2A and 3A curved up and meeting 1A, forming a basal anal cell; European ..... *Endophytus* Hering
- Forewing without basal anal cell, stub of 2A and 3A straight (fig. 1-3) .... 2
2. Malar space very narrow to absent; head punctate; holarctic [female lancet with narrow, rounded serrulae; male penis valve with slender lateral spine] ..... *Pseudodineura* Konow
- Malar space as broad or broader than diameter of front ocellus; head smooth; North American [female lancet with broad, flat serrulae; male penis valve with broad lateral spine] ..... *Kerita* Ross

*Kerita* Ross

*Kerita* Ross, 1937, p. 80.

Type-species: *Kerita fidala* Ross. Orig. desig.

This genus is separated by characters used in the preceding key. Only one species has been recorded, *K. fidala* from Illinois. Two new species from the western United States are here described. This genus is known only from North America.

Ross (1937) used the position of the ocelli as another character for separation of *Kerita* and *Pseudodineura*. The ocelli in *Kerita* form a "flatter" triangle and those in *Pseudodineura* form a "wide" triangle (Ross, 1937, fig. 294, 295). This appears to be a good character in addition to those used in the key, but it is extremely difficult to use when only single specimens are at hand.

## KEY TO SPECIES OF KERITA

(The male of only one species, *K. atira*, n. sp. is known)

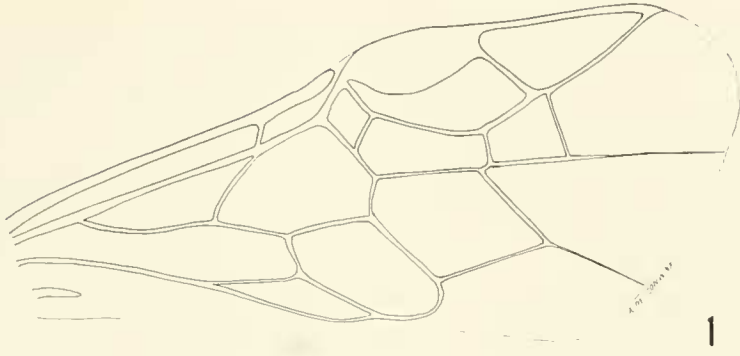
1. Lancet without a spurette above each serrula (fig. 15) western .....  
..... *K. atira*, new species
- Lancet with a distinct spurette above each serrula ..... 2
2. Antenna stout, its length only twice head width; spurettes on lancet small (fig. 14); eastern ..... *K. fidala* Ross
- Antenna long, its length three times head width; spurettes on lancet large (fig. 16); western ..... *K. difala*, new species

*Kerita atira* Smith, new species

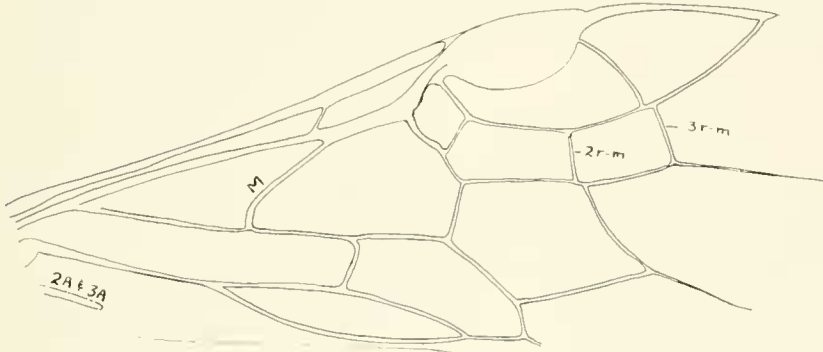
Female: Length 3.8 to 4.0 mm. Antenna and head black, clypeus sometimes brownish, labrum whitish, apex of each mandible reddish. Thorax black; tegulae

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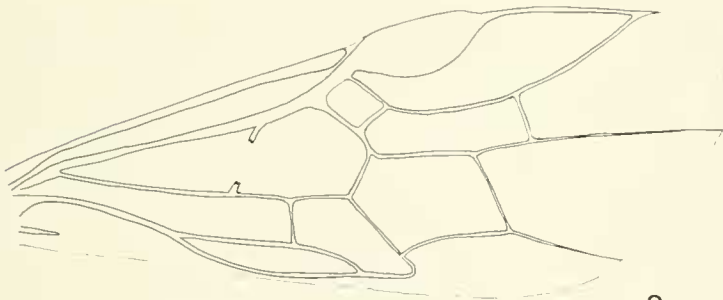
Fig. 1. Forewing of *Pseudodineura fuscula*. Fig. 2. Forewing of *Kerita atira*. Fig. 3. Forewing of *K. fidala*. Fig. 4. Hindwing of *K. fidala*. Fig. 5. Antenna of *K. fidala*, ♀. Fig. 6. Antenna of *P. parva*, ♀. Fig. 7. Antenna of *P. rileda*, ♀. Fig. 8, 9. *K. atira*. 8, Sheath lateral. 9, Sheath dorsal. Fig. 10, 11. *P. parva*. 10, Sheath lateral. 11, Sheath dorsal. Fig. 12, 13. *P. fuscula*. 12, Sheath lateral. 13, Sheath dorsal.



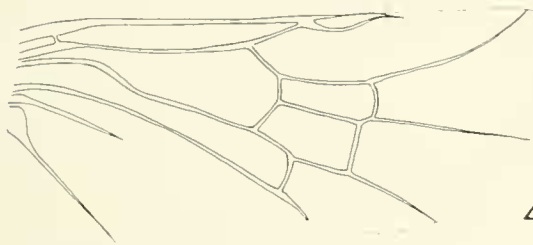
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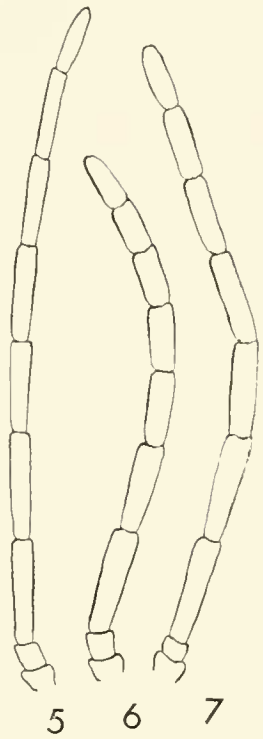
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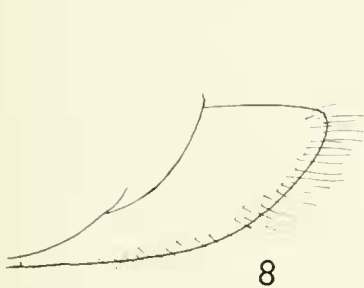
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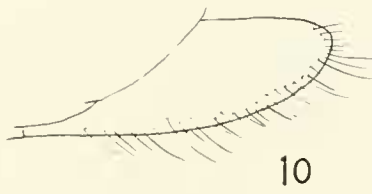
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13

sometimes whitish. Legs yellowish white; each coxa, each trochanter, and basal  $\frac{2}{3}$  of each front and middle femur black; basal half of hind femur sometimes black; each tarsus infuscated. Abdomen black, posterior margin of each segment with narrow white band. Wings hyaline, veins and stigma brownish.

Head and body smooth and shining, with short white pubescence. Length of antenna twice head width, segment 3 subequal in length to segment 4. Clypeus truncate; malar space equal to diameter of front ocellus. Forewing with radial crossvein faint, veins 2r-m and 3r-m both present, vein M present, intercostal vein present. Hindwing with cells Rs and M both present; anal cell absent. Sheath straight above, rounded below, in dorsal view narrow, broadest at base and tapering to acute apex. Lancet with 12 or 13 segments; serrule low, apical serrulae extended and pointed anteriorly, basal serrulae flat without anterior projection, each with no anterior and 7 to 10 fine posterior subbasal teeth; no spurettes evident (fig. 15).

Male: Length 3.7 to 3.9 mm. Coloration similar to that of female but with hypandrium yellowish. Antenna longer and more slender than in female, more than  $2\frac{1}{2}$  times head width and with segment 4 longer than segment 3. Other features as for those of female. Harpe and parapenis as in fig. 21; penis valve slender, with long apical filament and broad lateral spine (fig. 22).

Holotype: Female, Weston, Oregon, April 29, 1938, on mustard, K. Gray. USNM type no. 73208.

Paratypes: ALBERTA: Bilby, June 1, 1924, O. Bryant (1 ♀). CALIFORNIA: Tracy, San Joaquin Co., III-10-1933, collected from alfalfa, A. C. Browne (1 ♀); Concord, III-25-37 (1 ♀); Diablo, III-14-37 (1 ♂). IDAHO: Moscow, April 19, 1937, 2560 ft., C. C. Ball (1 ♂); Worley, V-14-33, R. D. Shenefelt (1 ♀); Lewiston, V-8-1935, 550 ft., W. E. Shull (1 ♀). OREGON: same data as for holotype (2 ♀♀, 8 ♂♂); 5 mi. N. Dufur, May 5, 1938, K. Gray and J. Schuh (1 ♀); Thorn Hollow, April 29, 1938, K. Gray and J. Schuh (1 ♀); Talent, April 20, 1938, L. G. Gentner (1 ♀); Aneroid Lake, Wallowa Mts., 7500 ft., B. Malkin (1 ♂). WASHINGTON: Maryhill, April 28, 1938, on wild sunflower, K. Gray (1 ♂). At the U.S. National Museum, Oregon State University, University of California, California Academy of Sciences, and Illinois Natural History Survey.

Host: Unknown. Adults have been collected from various plants such as mustard, alfalfa, and wild sunflower, none of which may represent the true host plant of the larva.

Discussion: The female lancet of this species lacks evidence of spurettes above the serrulae which are present in *fidala* and *difala*. The antennae is also much shorter than that of *difala* being only twice the head width in length, whereas it is three times the head width in *difala*.

The name is an arbitrary combination of letters and is to be treated as a noun.

*Kerita difala* Smith, new species

Female: Length, 4.0 mm. Antenna and head black; labrum and maxillary and labial palpi brownish; apex of each mandible reddish. Thorax black with



tegulae yellowish. Legs yellowish; each coxa except for extreme apex black; basal half of each front and middle femur and each tarsus infuscated. Abdomen brownish. Wings hyaline, veins and stigma brownish.

Head and body smooth and shining with short white pubescence. Length of antenna nearly 3 times head width; segment 3 subequal in length to segment 4. Clypeus truncate; malar space equal diameter of front ocellus. Forewing with radial crossvein faint; veins 2r-m and 3r-m both present; vein M present; intercostal vein present. Hindwing with cells Rs and M both present; anal cell absent. Sheath narrow in lateral view, straight above, rounded below, acute at apex; in dorsal view slender, broadest at base and tapering to acute apex. Lancet with 11 to 12 segments; apical serrulae extended anteriorly, basal serrulae flat, each with no anterior and 7 to 10 fine posterior subbasal teeth; rather large, distinct spurette dorsal to each serrula (fig. 16).

Male: Unknown.

Holotype: Female. Salt Lake, Utah, Bells Canyon, July 19, 1917, 7000 to 9000 ft., A. B. Gahan, collector. USNM type no. 73207.

Paratype: WASHINGTON: Sunrise Ridge, Mt. Rainier, 5500', VII-23-40, H. and M. Townes (1 ♀). At the University of California.

Host: Unknown.

Discussion: The long antenna, its length being three times the width of the head, and the large spurettes of the female lancet will distinguish this species from both *atira* and *fidala*.

This species name is an arbitrary combination of letters and is to be treated as a noun.

#### *Kerita fidala* Ross

*Kerita fidala* Ross, 1937, p. 80, ♀; Ross, 1945, p. 155 (figure of clypeal region); Ross, 1951, p. 53 (in catalog); Maxwell, 1955, p. 74 (internal larval anatomy).

Female: Length 3.7 to 4.0 mm. Antenna and head black, labrum and maxillary and labial palpi brownish, apex of each mandible reddish. Thorax black. Legs whitish yellow, each coxa except for apex, and basal half of each front and middle femur black; hind femur sometimes infuscated at base. Abdomen black with narrow whitish band on posterior margin of each segment. Wings hyaline, veins and stigma brownish.

Head and body smooth and shining, with white pubescence. Malar space a little more than diameter of front ocellus. Length of antenna about 2 times head width; segment 3 subequal in length to segment 4. Forewing with vein M absent or partially atrophied, 2r-m and sometimes 3r-m absent, r absent or faint, intercostal vein present or absent. Hindwing with cells Rs and M both present, anal cell absent. Sheath straight above, rounded below and at apex, from above slender, broadest at base tapering to acute apex. Lancet with 13 segments; serrulae low, those on apical part of lancet narrow and directed anteriorly, those on basal part of lancet flat, without projection, each with no anterior and 8 to 10 fine posterior subbasal teeth; small spurette dorsal to each serrula (fig. 14).

Male: Unknown.

Type: From Muncie (spelled Munsey on label) Ill., April 25, 1914, ♀ holotype at the Illinois Natural History Survey.

Distribution: ILLINOIS: Muncie, Apr. 25, 1914; LaSalle Co., April 5, 1938, April 27, 1937; Wedron, April 14, 1937, April 16, 1946, on *Mertensia virginica*; Cornland, April 28, 1949, in woods. INDIANA: Veedersburg April 23, 1950, on *Mertensia*.

Host: *Mertensia*.

Discussion: The presence of small spurettes above each serrula of the lancet will distinguish this species from *atira*. From *difala* it is separated by the smaller spurettes and shorter antennae with their length being only twice the head width. Many of the specimens examined of this species, including the holotype, lack vein M in the forewing or vein M is present as only a short stub. This wing venation was not found in the other species and not in all specimens of *fidala*. The presence or absence of vein M must be highly variable and cannot be a generic character as given by Ross (1937). Also veins 2 r-m and 3 r-m may be present or absent, even in the opposite wings of the same individual.

There were no males among the hundred or more specimens examined from Illinois.

#### *Pseudodineura* Konow

*Dolerus* subg. *Pelmatopus* Hartig, 1837, p. 244. Preocc. by Fischer de Waldheim, 1824. Type-species: *Dolerus (Pelmatopus) minutus* Hartig. Monotypic. *Pseudodineura* Konow, 1885, p. 297. Type-species: *Tenthredo (Allantus) parvula* Klug. Desig. by Rohwer, 1911.

*Phyllopais* Hering, 1934, p. 353. N. name for *Pelmatopus* Hartig.

This genus is characterized by the characters given in the preceding key to genera. Four species are now known from North America, *parva* (Norton), *fuscula* (Klug) which may be an adventive from Europe, and two new species described here. Keys to the European species of this genus are given by Enslin (1921) and Hering (1929).

#### KEY TO NORTH AMERICAN SPECIES OF PSEUDODINEURA

- |   |                        |
|---|------------------------|
| 1. Female .....   | 2                      |
| — Male .....  | 5                      |
| 2. Sheath from above short and broad, broader than long, broadly rounded at apex (fig. 13); serrulae of lancet long, slender (fig. 17) ....   | <i>fuscula</i> (Klug)  |
| — Sheath from above slender, longer than broad, tapering to narrow, blunt point at apex (fig. 11); serrulae of lancet low (figs. 18-20) ..... | 3                      |
| 3. Lancet with 11 serrulae, each serrula slightly longer than broad (fig. 19) western .....   | <i>lehosa</i> , n. sp. |
| — Lancet with 13 or 14 serrulae, each serrula low, broader than long (fig. 18, 20); eastern .....   | 4                      |
| 4. Mesopleuron usually pale reddish orange (sometimes black); abdomen   |                        |

- with considerable brown toward apex (sometimes more black than brown); antenna less than twice head width ..... *parva* (Norton)
- Mesopleuron and abdomen black; antenna 2 times or more head width ..... *rileda*, n. sp.
5. Mesopleuron usually pale reddish orange (sometimes black); abdomen with considerable brown toward apex (sometimes more black than brown); antenna less than 2 times head width ..... *parva* (Norton)
- Mesopleuron and abdomen black; antenna 2½ times or more head width .. 6
6. Eastern ..... *rileda*, n. sp.
- Western ..... *lehosa*, n. sp.

*Pseudodineura fuscula* (Klug)

*Teuthredo fuscula* Klug, 1814, p. 70.

*Pseudodineura fuscula*: Dalla Torre, 1894, p. 159 (many references prior to 1894); Konow, 1905, p. 88–89 (*Dineura despecta* Hartig, 1837, *Pelmatopus minutus* Hartig, 1837, and *Dineura simulans* Cameron, 1877, listed as synonyms); Wahlgren, 1944, p. 143 (biology); Benson, 1958, p. 155 (England); Lorenz and Kraus, 1957, p. 144 (larva); Hellén, 1960, p. 6 (Finland); Viramo, 1969, p. 30 (Finland).

*Pelmatopus fuscula*: Enslin, 1914, p. 273; Enslin, 1921, p. 185 (distribution, hosts); Hering, 1929, p. 103 (biology); Buhr, 1941, p. 920 (biology).

Female: Length, 4.2 to 4.5 mm. Antenna and head black; labrum and maxillary and labial palpi brownish. Thorax black; tegula brownish. Legs with each coxa and usually basal ⅔ of each femur black; each trochanter, apical ⅓ of each femur, each tibia, and each tarsus dark reddish brown. Abdomen black. Wings lightly, uniformly infuscated; veins and stigma brown.

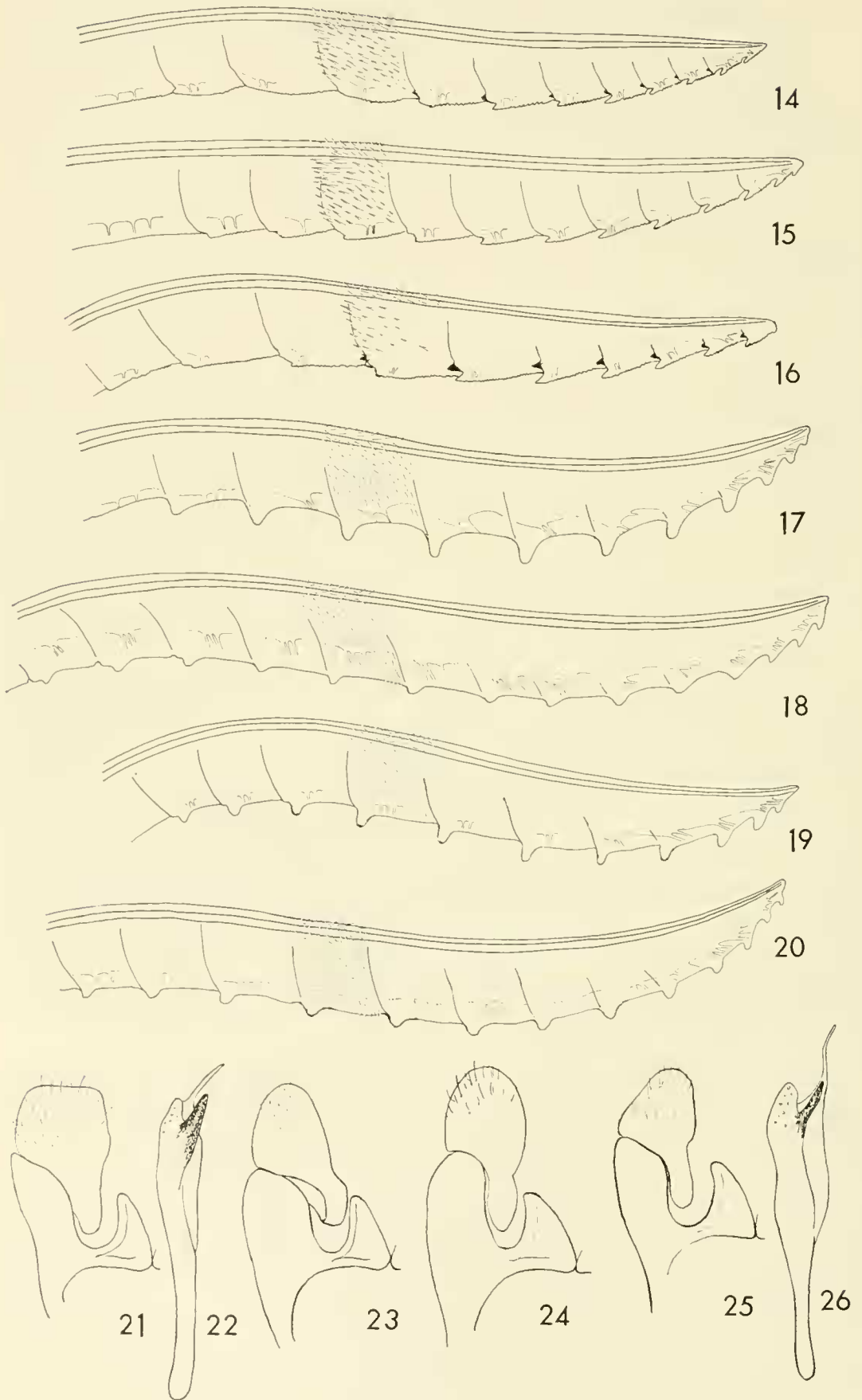
Clypeus truncate; malar space narrow, less than half diameter of front ocellus; head moderately shining but roughened with punctures. Sheath narrow and rounded at apex in lateral view; in dorsal view broader than long, broadly-rounded at apex with short median keel (fig. 12, 13). Lancet with 11 to 12 serrulae; each serrula long, slender rounded at apex and without subbasal teeth; central and apical serrulae each longer than broad; lancet evenly clothed with fine hairs (fig. 17).

Male: Unknown in North America. I have not seen specimens. According to Benson (1958) similar in coloration to the female.

Types: Not seen. The interpretation of this species is based on Hering (1929), Enslin (1914), Benson (1958), and specimens in the U.S. National Museum identified by Benson and Forsius.

Distribution: North and Central Europe to Siberia. I have seen the following from North America. CONNECTICUT: Stamford, 5-18-1944. MAINE: Kents Hill, Kennebec Co., May 28, 1967; Brownville Junction, May 27, 1966; 3 mi. N. Passadumkeag, Penobscot Co., May 26, 1966; Orono, May 30, 1958. VERMONT: 2 mi. N. Concord, Essex Co., May 22, 1966.

Host: In Europe, this species is a leafminer in the larval stage on various species of *Ranunculus*. The collections I made in Maine in 1966 and 1967 were mostly sweepings from various herbaceous plants in open fields.





Discussion: This species is distinguished from other North American *Pseudodineura* by the shape of the sheath (very broad and blunt at the apex in dorsal view), and by the long slender serrulae of the lancet. It is possible that this species is adventive from Europe. It has not before been recorded from North America and the earliest date of capture is 1944. It also follows the distribution pattern of some other adventive species such as *Fenusa pusilla* (Lepelletier), *Messana* (Klug), and *Heterarthrus nemoratus* (Fallén).

The references given for this species are only the more significant ones.

*Pseudodineura lehosa* Smith, new species

Female: Length, 4.0 to 4.3 mm. Antenna and head black; labrum and maxillary and labial palpi brownish. Thorax black with tegula and pronotum pale brown; anterior portion of pronotum may be blackish and mesopleuron sometimes tending toward brown. Legs yellow orange with most of each coxa black. Abdomen black, sometimes more brownish toward apex. Wings lightly, uniformly infuscated; veins and stigma brown.

Antenna stout, about  $1\frac{1}{2}$  times head width. Malar space nearly absent; clypeus truncate; head moderately shining but with numerous punctures. Sheath in lateral view straight above, rounded below and at apex; in dorsal view, slender, longer than broad, broadest at base and tapering to bluntly rounded apex (fig. 10, 11). Lancet with 11 serrulae; each serrula rounded, somewhat elongate and slightly longer than broad, without subbasal teeth (fig. 19).

Male: Length, 4.0 to 4.2 mm. Coloration similar to that of female except thorax which is entirely black, front femur which has basal  $\frac{1}{3}$  blackish, and apex of hypandrium which is pale brown. Antenna long, slender, more than 2 times head width. Harpe and parapenis and penis valve as in fig. 24, 26.

Holotype: Corvallis, Oregon, May 17, 1929, Francis B. Foley, collector. ♀. USNM type no. 73206.

Paratypes: BRITISH COLUMBIA: London Hill Mine, Bear Lake, 21-7-03, Altitude 7000 ft., R. P. Currie, collector (1 ♂). IDAHO: Moscow Mt., June 26, 1920, A. L. Melander (1 ♀); Lochsa Riv., 8 mi. NE Lowell, Clearwater Co., Glade Cr., IV-25-63, W. F. Barr, A. R. Gittins, collectors (1 ♀, 1 ♂). In the U.S. National Museum and University of Idaho.

Host: Unknown.

←

Fig. 14. Lancet of *Kerita fidala*. Fig. 15. Lancet of *K. atira*. Fig. 16. Lancet of *K. difala*. Fig. 17. Lancet of *Pseudodineura fuscula*. Fig. 18. Lancet of *P. rileda*. Fig. 19. Lancet of *P. lehosa*. Fig. 20. Lancet of *P. parva*. Fig. 21. Harpe and parapenis of *K. atira*. Fig. 22. Penis valve of *K. atira*. Fig. 23. Harpe and parapenis of *P. parva*. Fig. 24. Harpe and parapenis of *P. lehosa*. Fig. 25. Harpe and parapenis of *P. rileda*. Fig. 26. Penis valve of *P. rileda*. The figures of the lancets show one segment complete; this texture, either hairs or short spines, is found on all segments.

Discussion: Though very similar to two eastern species, *parva* and *rileda*, the lancet of *lehosa* appears to be distinctive in having fewer serrulae and with the serrulae somewhat longer than broad. The mesopleuron of *lehosa* is never reddish as in some specimens of *parva*, and the antennae are only one and half times the head width, whereas they are two times or more the head width in *rileda*. I could not separate the males of *lehosa* and *rileda*.

The species name is an arbitrary combination of letters and is to be treated as a noun.

*Pseudodineura parva* (Norton)

*Dineura parva* Norton, 1867, p. 241. ♂.

*Mesoneura parva*: Dalla Torre, 1894, p. 185; Konow, 1905, p. 78.

*Pseudodineura parva*: Ross, 1935, p. 203; Ross, 1951, p. 53.

Female: Length, 4.0 to 4.5 mm. Antenna and head black; clypeus usually light brownish, sometimes mostly black; labrum and maxillary and labial palpi brownish. Thorax black with tegula, pronotum, and mesopleuron reddish orange; mesopleuron may be black or partly black and pronotum may be blackish on anterior half. Legs pale yellow orange with base of each coxa black. Abdomen brownish to black, normally with anterior half of each segment black and posterior half brown with brownish areas increasing in size toward apex. Wings very lightly, uniformly infuscated; veins and stigma brown.

Antenna stout, less than twice head width and usually 1½ times head width. Malar space nearly absent; clypeus truncate; head densely punctate to roughened with punctures indistinct. Sheath in lateral view slender, rounded at apex; in dorsal view rather slender, longer than broad, broadest at base and tapering to narrow, bluntly rounded apex (fig. 10, 11). Lancet with 13 serrulae; each serrula low, rounded, no longer than broad, and without subbasal teeth (fig. 20).

Male: Length, 4.0 to 4.3 mm. Coloration similar to that of female except for mesepisternum which is normally black; apical tergite and hypandrium yellow orange. Antenna stout, less than twice head width. Harpe and parapenis and penis valve as in fig. 23, 26.

Holotype: At the Academy of Natural Sciences of Philadelphia, ♂, type no. 10309, and, according to the original description, from Farmington, Connecticut. A female allotype, as designated by Ross (1935) from Hampton, N. H., is in the Illinois Natural History Survey.

Distribution: Eastern North America west to Alberta. ALBERTA: Edmonton, 10-VII-1929. CONNECTICUT: Farmington (type). MARYLAND: Plummers Is., 4-14-08; Cabin John, April, 1917. NEW HAMPSHIRE: Hampton, V-9-1906, V-1-1907. NEW YORK: Ithaca, V-6-1936; McLean Bogs Reserve, Tompkins Co., July 31, 1940. PENNSYLVANIA: Castle Rock, IV-13-10, IV-17-08.

Host: Ross (1951) recorded the host as *Hepatica*.

Discussion: This is the only species which has a reddish mesopleuron and somewhat brownish abdomen; however, in a few specimens, these areas tend to be darker tending toward brown or black. Other

than color, the females are separated by the 13 or 14 segmented lancet with the serrulae somewhat broader than long and by the short antennae which are less than two times the head width. The males are separated by the usually reddish mesopleuron and by the short antennae which are less than two times the head width.

Until now, this was the only species of *Pseudodineura* recorded in North America.

*Pseudodineura rileda* Smith, new species

Female: Length, 4.4 to 4.6 mm. Antenna and head black; clypeus sometimes brownish on anterior margin; labrum and maxillary and labial palpi brownish. Thorax black with tegula and posterior margin of pronotum brownish. Legs yellow orange; most of each coxa black. Abdomen black, rarely with brownish markings; sheath black. Wings lightly uniformly infuscated; veins and stigma brownish.

Antenna rather slender, its length 2 times or more head width. Malar space nearly absent; clypeus truncate; head densely punctate to roughened. Sheath in lateral view slender, rounded at apex; in dorsal view slender, longer than broad, broadest at base and tapering to narrow, bluntly rounded apex (fig. 10, 11). Lancet with 14 serrulae, each serrula low, rounded, broader than long, and without subbasal teeth (fig. 18).

Male: Length, 4.2 to 4.4 mm. Coloration similar to that of female though normally with clypeus black, thorax black except for brownish tegulae, and apex of hypandrium pale brown. Antenna long, its length 2½ times or more width of head. Harpe and parapenis and penis valve as in fig. 25, 26.

Holotype: LaSalle Co., Ill., 4-24-1937, Floyd G. Werner, ♀, in the Illinois Natural History Survey.

Paratypes: ILLINOIS: same data as for holotype (3 ♂♂). MICHIGAN: E. Lansing, Ingham Co., 24 April 1960, George Eickwort (1 ♀). NEW YORK: N. Evans, 5-14-10, M.C.V. coll. (♀). At the Illinois Natural History Survey, California Academy of Sciences, Michigan State University, and U.S. National Museum.

Host: Unknown.

Discussion: The darker coloration, longer and more slender antennae, and more slender lancet with lower and broader serrulae should separate this species from *parva* and *rileda*.

The name is an arbitrary combination of letters and should be treated as a noun.

I express my appreciation to the following for allowing me to examine specimens in their respective collections: D. W. Webb, Illinois Natural History Survey, Urbana; P. Arnaud, Jr., California Academy of Sciences, San Francisco; R. Fischer, Michigan State University, East Lansing; D. Rentz, Academy of Natural Sciences, Philadelphia, Pa.; A. Gittins, University of Idaho, Moscow; W. W. Middlekauff, University of California, Berkeley; P. O. Ritcher, Oregon State University, Corvallis; G. Gibson, Biosystematics Research Institute, Canada Depart-



ment of Agriculture, Ottawa. Other material used in this paper is in the U.S. National Museum, Washington, D.C. The figures of the lancets and wings were drawn by K. M. Conway.

## REFERENCES

- Benson, R. B. 1938. On the classification of sawflies (Hymenoptera: Symphyta) Trans. Roy. Entomol. Soc. London 87:353-384.
- . 1958. Hymenoptera (Symphyta) Family Tenthredinidae. In Royal Entomological Society of London, Handbooks for the Identification of British Insects, v. 6, pt. 2(c), pp. 139-252.
- Buhr, H. 1941. Beobachtungen über Nahrungspflanzen, Verbreitung und Auftreten von minierenden Blattwespen. Munchen. Entomol. Gesell. Mitt. 31:903-926.
- Dalla Torre, C. G. 1894. Catalogus Hymenopterum, v. 1. Tenthredinidae incl. Uroceridae (Phyllophaga and Xylophaga). 459 pp.
- Enslin, E. 1914. Die Tenthredinoidea Mitteleuropas. Beit. Deut. Entomol. Ztschr., pp. 203-309.
- . 1921. Beiträge zur Kenntnis der Tenthredinoidea VII. (Hym.). Entomol. Mitt. 10:181-185.
- Hartig, T. 1837. Die Familien der Blattwespen und Holzwespen, nebst einer Allgemeinen Einleitung zur Naturgeschichte der Hymenopteren. 416 pp.
- Hellén, W. 1960. Die Nematinen Finnlands (Hym., Tenthred.). Notulae Entomol. 40:1-18.
- Hering, M. 1929. Die Blattminierer-Gattung *Pelmatopus* Htg. (Hym. Tenthred.). Ztschr. für Wiss. Insektenbiol. 24:97-107.
- . 1934. Neue Gattungsbezeichnungen minierender Tenthrediniden (Hymenopt.). Internat. Entomol. Ztschr. 28:353.
- . 1935. Die Blatt-Minen Mittel-und Nord-Europas. Bestimmungstabellen aller von Insekten-Larven der verschiedenen Ordnungen erzeugten minen. Lieferung 1, pp. 1-112.
- Klug, J. C. F. 1814. Die Blattwespen nach ihren Gattungen und Arten zusammengestellt. Gesell. Naturf. Freunde, Berlin, Mag. 8:42-84.
- Konow, F. W. 1885. Ueber Blattwespen. Wien. Entomol. Ztg. 4:295-301.
- . 1905. Hymenoptera, Fam. Tenthredinidae. In Wytsman, P., ed., Genera Insectorum, fasc. 29, 176 pp.
- Lorenz, H. and Kraus, M. 1957. Die Larvalsystematik der Blattwespen (Tenthredinoidea und Megalogoidea), 339 pp.
- Maxwell, D. E. 1955. The comparative internal larval anatomy of sawflies (Hymenoptera: Tenthredinidae). Canad. Entomol. 87 (Sup. 1):1-132.
- Norton, E. 1867. Catalogue of the described Tenthredinidae and Uroceridae of North America. Trans. Amer. Entomol. Soc. 1:193-280.
- Röhrer, S. A. 1911. The genotypes of the sawflies and woodwasps, or the superfamily Tenthredinoidea. U.S. Dept. Agr., Bur. Entomol., Tech. Ser. No. 20, pt. II, pp 69-109.
- Ross, H. H. 1935. The Nearctic sawflies of the *Dineura* complex (Hymen.: Tenthredinidae). Canad. Entomol. 67:201-205.
- . 1937. A generic classification of the Nearctic sawflies (Hymenoptera: Symphyta). Ill. Biol. Monog. 15(2):1-173.



- . 1945. A new tribe and genus of Nematine sawfly (Hymenoptera: Tenthredinidae). *Pan-Pacific Entomol.* 21:153-156.
- . 1951. Tenthredinidae. In Musebeck, C. F. W., et al., Hymenoptera of America North of Mexico, Synoptic Catalog, U.S. Dept. Agr., Agr. Monog. 2, pp. 22-64, 66-82.
- Vikberg, V. 1967. *Endophytus anemones* (Hering) in Finland (Hym., Tenthredinidae). *Ann. Entomol. Fenn.* 33:265-268.
- Viramo, J. 1969. Zur Kenntnis der Miniererfauna Finnlands. Über die Wirtspflanzen und die Verbreitung der minierenden Blattwespen (Hym., Tenthredinoidea). *Ann. Entomol. Fenn.* 35:3-44.
- Wahlgren, E. 1944. Bladminerande tenthredinidlarver. *Opusc. Entomol.* 9: 138-149.

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### BOOK NOTICES

**The Earwigs of California (Order Dermaptera).** 1975. By R. L. Langston and J. A. Powell. *Bulletin of the California Insect Survey*, vol. 20: pp. 1-25, 11 figs., 10 maps. University of California Press. \$2.00.

In this recent number of the well known Survey series, 21 species are recorded from California. Only one of them is considered really native; the others have come from elsewhere, in some cases a great many years ago. This bulletin is a very useful contribution.—A.B.G.

**Borne on the Wind. The Extraordinary World of Insects in Flight.** 1975. By Stephen Dalton. 160 pp., 74 color plates, other black and white figures. Reader's Digest Press, E. P. Dutton & Co. \$18.95.

The outstanding feature of this splendid volume is the colored photographs of untethered insects in natural flight, which became possible when precision equipment was developed which involved utilizing the insects themselves to trigger camera action by flying through a light beam, an electronic shutter with opening speed of about 1/450 second, and fantastic film exposure speed. Many pictures were taken in Everglades National Park, Florida. As a result, Stephen Dalton, an English naturalist-photographer, has done for insects largely what Crawford H. Greenewalt did for flying hummingbirds.

In a foreword, Howard E. Evans has contributed thought-provoking comments on the nature and unusual uses of insect wings, the possibilities of very rapid flight, and some records of long flights. In the brief text chapters, Dalton has given general accounts of the chief insect orders, with comments on the species which were photographed.—A.B.G.